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(Under International Convention.)

Date claimed for Patent under Patents and Designs Act, 1907, being date of first Foreign Application (in Germany), 2nd Jan., 1912

Date of Application (in the United Kingdom), 1st Jan., 1913

At the expiration of twelve months from the date of the first Foreign Application, the provision of Section 91 (3) (a) of the Patents and Designs Act, 1907, as to inspection of Specification, became operative

Accepted, 3rd July, 1913

COMPLETE SPECIFICATION.

Improvements in Locomotive Blast Apparatus and the like.

I, HENRI AUGUSTE DAUBOIS, of No. 4, rue Belgrand, and formerly of No. 171bis, rue de Charenton, Paris, France, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in locomotive blast apparatus and the like of the kind in which the exhaust steam is used to drive a turbine arranged in the smoke box on the shaft of which are mounted fans for withdrawing the products of combustion from the smoke box and forcing the same into the chimney.

The invention consists in an apparatus of this kind comprising a turbine having its shaft in vertical alignment with the axis of the chimney and receiving the exhaust steam axially through its whole periphery, the vertical shaft of the turbine carrying a fan arranged above the turbine casing and under the chimney.

By this arrangement a strong and efficient construction is obtained wherein the energy of the exhaust steam is fully utilised to increase the draught without creating any objectionable back pressure on the pistons of the locomotive. The exhaust steam passing through the turbine parallel to its axis, the lateral thrust existing in the case of a tangential admission is avoided whereby the friction and wear of the bearings are greatly reduced. The axial thrust exerted upwardly by the steam on the turbine wheel is also balanced by the downward reaction of the fan whereby the friction is further reduced. The pivot and the ball bearing of the rotating system being entirely removed from the contact with the gases in the smoke box, the operation is also greatly improved. Moreover the construction is very simple and the device may be easily mounted on existing locomotives or the like.

The drawing illustrates a constructional example of the invention as applied to a locomotive.

In this example the steam exhaust pipe *a* of the locomotive is connected to the casing *b* of a turbine, said exhaust pipe being in communication with a

central conduit b^2 of the casing, which leads the exhaust steam into an annular passage b^3. The running wheel c of the turbine is fixed on the tubular shaft d. This shaft d drives directly a fan f which may be situated for instance in the lower end of the chimney g. The turbine and the fan are arranged in the smoke box. The rotating system comprising the running wheel of the turbine and the fan, is supported and guided by means of a pivot or shaft h and a ring of balls i. In the construction shown, the wheel c has two sets of blades c^1, c^2, and a series of stationary directing blades b^1 carried by the turbine casing b are arranged between the two sets of running blades c^1, c^2. The rubbing parts are completely sheltered from the direct action of the gases in the smoke box and their lubrication is ensured by means of channels provided in the fixed parts of the turbine.

The exhaust steam coming from the cylinders passes through the turbine parallel to its axis and after its passage therethrough is collected by a pipe j, which leads it to a point where it can be used. The rotation of the fan produced by the turbine generates in the chimney a continuous draught which varies slowly with the total quantity of the exhaust steam, but is sheltered from the short beats that are caused by the 2, 4, 6 or 8 stroke working of the power cylinders.

The fan works in no case against the natural draught of the furnace. An ejector blower may be added to the fan. The action of the fan may be moderated by means of a damper or by other means.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is;—

1.—In a locomotive blast apparatus and the like of the kind described, the arrangement of a turbine having its shaft in vertical alignment with the axis of the chimney and receiving the exhaust steam axially through its whole periphery and a fan secured on the turbine shaft above the turbine casing and under the chimney, substantially as described and for the purpose set forth.

2.—In a locomotive blast apparatus and the like of the kind described, the arrangement, in the smoke box, of a turbine casing which carries steam directing vanes, a vertical pivot supported in said casing in vertical alignment with the axis of the chimney, a tubular rotating shaft arranged around the pivot and supported by the same at the upper end, a helical fan carried by said shaft and arranged under the chimney, above the turbine casing, a turbine wheel having a number of series of vanes and being secured on the lower end of the tubular shaft and guided on the lower end of the pivot by a ball bearing, the exhaust steam of the locomotive being led to said wheel parallel to its axis through an annular conduit formed in the lower end of the turbine casing, and the exhaust steam discharged from the turbine being received in a suitable pipe substantially as described and for the purpose set forth.

Dated this 31st day of December, 1912.

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